

**Work Order ID: 114478**

Thursday, March 06, 2014 11:36:18 AM

**\*114478\***

Page 1

Item ID: D212-664-201

Accept

**\*N900040100\***Setup Start **\*NS1\***

Revision ID:

Stop **\*NS2\***

Item Name: Aft Crosstube - High

Start Date: 3/6/2014 Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 3/12/2014 Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals:

Process Plan: 11Date: 14-03-06

Tooling:

Date:

Run Start **\*NR1\***

QC:

Date:

SPC (Y/N):

Date:

Stop **\*NR2\***Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool # Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

Draw Nbr

Revision Nbr

D212-664-241

Rev D (DEO)

DSI9563

B

100

Document Control

0.00

**\*100\***

DC

DOCUMENT CONTROL

Memo

0.00

Doc.Control -USB or Paperwork

Photocopy bluefile and create labels as per PPP D212-664-201

CHG005

DAS  
06  
3-89

MAR 27 2014

MKT

110

Pick Kit

0.00

**\*110\***

Packaging

Packaging

Memo

0.00

Packaging

MD

14/03/06

P/B

DQA:

Date: 14/04/09

QA Closed:

Date: 14-4-10

## WORK ORDER NON-CONFORMANCE / UPDATE

Work Order update only ☐

Work Order: 11 478	<b>DISPOSITION</b> Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input checked="" type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	<b>AGAINST DEPARTMENT/PROCESS</b>			
Part No. 12 1064-201		Skid-tube <input type="checkbox"/>	Crosstube <input checked="" type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>
NCR No. 11 3094		Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>
		Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>
		Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	

Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data		14/	120	Tube crushing is over tolerance	DAS 12 9-89	Acceptable.	DAS 12 9-89		
Equip/Tooling						Location is not critical.			
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

## FAULT CATEGORY

<b>Landing Gear</b> <input checked="" type="checkbox"/> Bearing <input type="checkbox"/> Center Not Concentric <input type="checkbox"/> Cracks <input type="checkbox"/> Creep /Kink/Ripple/Wave <input type="checkbox"/> Cutting <input type="checkbox"/> Drawing <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Material /Chatter <input type="checkbox"/> Tube Sequence <input type="checkbox"/> Weld /Twist in Tube	<b>General</b> <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge	<input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
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**Work Order ID 114478**

Thursday, March 06, 2014 11:36:18 AM

**\*114478\***

Page 2

Item ID: D212-664-201

Accept

**\*N900040100\***Setup Start **\*NS1\***

Revision ID:

Item Name: Aft Crosstube - High

Stop **\*NS2\***

Start Date: 3/6/2014 Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 3/12/2014 Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals:

Process Plan: \_\_\_\_\_

Date: \_\_\_\_\_

Tooling: \_\_\_\_\_

Date: \_\_\_\_\_

Run Start **\*NR1\***

QC: \_\_\_\_\_

Date: \_\_\_\_\_

SPC (Y/N): \_\_\_\_\_

Date: \_\_\_\_\_

Stop **\*NR2\***Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

120

0.00

**\*120\***

CNC Bend 2

CNC Alpha 160 Bender

BENDING MACHINE - CROSSTUBES

Memo

0.00

\*\*\*VERF SET-UP BEFORE BENDING BY:                     \*\*\*

Bend tube as per Dwg D212-664-241 using CNC bender program 212-aft

                     14-03-07                     

130

0.00

**\*130\***

QC

Quality Control

QC15- Crosstube Dimensional Check

Memo

0.00

DAS  
16  
9-89  
14/23/10

DQA: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_

Date: \_\_\_\_\_

Work Order update only ☐

Work Order: _____  Part No. _____  NCR No. _____	<b>DISPOSITION</b>  Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	<b>AGAINST DEPARTMENT/PROCESS</b>  <table style="width:100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
Equip/Tooling	<input type="checkbox"/>								
Handling/Pre	<input type="checkbox"/>								
Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

### FAULT CATEGORY

<b>Landing Gear</b> <input type="checkbox"/> Bearing <input type="checkbox"/> Center Not Concentric <input type="checkbox"/> Cracks <input type="checkbox"/> Corrosion/Kink/Ripple/Wave <input type="checkbox"/> Cuff <input type="checkbox"/> Cracking <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Malfunction/Chatter <input type="checkbox"/> Tumbling Sequence <input type="checkbox"/> Warpage/Twist in Tube	<b>General</b> <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence  <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge  <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
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**Work Order ID 114478**

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**\*114478\***

Page 3

Item ID: D212-664-201

Accept

**\*N900040100\***Setup Start **\*NS1\***

Revision ID:

Stop **\*NS2\***

Item Name: Aft Crosstube - High

Start Date: 3/6/2014 Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 3/12/2014 Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop **\*NR2\***Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

140

0.00

**\*140\***

Crosstubes

Crosstubes

Memo

0.00

1-Drill pilot holes in tube as per Dwg D212-664-241 using drill Jig DT8550, DT8551, drill table DT8577 and locate tower holes #8 as per QSI0010.

2-Ream hole to finish size in tube as per Dwg D212-664-241 using drill Jig DT8550 &amp; DT8551. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-241

4- \*\*\*WEAR LATEX GLOVES HANDLING CROSSTUBE.\*\*\* Deburr &amp; Inspect for surface damage. Repair damage within limits as per Dwg D212-664-241

150

QC5- Inspect part completeness to step on W/O

0.00

DAS

27

9-89

**\*150\***

QC

Memo

0.00

\*\*\*WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.\*\*\*

Quality Control

JW 14-03-11  
TE  
JW 14-03-11

14/3/12

DQA: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

Work Order: _____  Part No. _____  NCR No. _____	<b>DISPOSITION</b>  Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	<b>AGAINST DEPARTMENT/PROCESS</b>  <div style="display: flex; justify-content: space-between;"> <div>             Skid-tube <input type="checkbox"/>              Machining <input type="checkbox"/>              Thermoforming <input type="checkbox"/>              Large Fab <input type="checkbox"/> </div> <div>             Crosstube <input type="checkbox"/>              Small Fab <input type="checkbox"/>              Finishing <input type="checkbox"/>              Composite <input type="checkbox"/> </div> <div>             Water Jet <input type="checkbox"/>              Prod. Eng. Coord. <input type="checkbox"/>              Rec/Store/Packaging <input type="checkbox"/>              Supplier <input type="checkbox"/> </div> <div>             Engineering <input type="checkbox"/>              Quality <input type="checkbox"/>              Other <input type="checkbox"/> </div> </div>
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Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
Equip/Tooling	<input type="checkbox"/>								
Handling/Pre	<input type="checkbox"/>								
Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

### FAULT CATEGORY

<b>Landing Gear</b> <input type="checkbox"/> Bearing <input type="checkbox"/> Center Not Concentric <input type="checkbox"/> Cracks <input type="checkbox"/> Creep/Kink/Ripple/Wave <input type="checkbox"/> Cuff <input type="checkbox"/> Cracking <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Malfunction/Chatter <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Warpage/Twist in Tube	<b>General</b> <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence  <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge  <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
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**Work Order ID 114478**

Thursday, March 06, 2014 11:36:18 AM

**\*114478\***

Page 4

Item ID: D212-664-201

Accept

**\*N900040100\***Setup Start **\*NS1\***

Revision ID:

Item Name: Aft Crosstube - High

Stop **\*NS2\***

Start Date: 3/6/2014 Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 3/12/2014 Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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160

0.00

**\*160\***

HandFXtube

Memo

0.00

Hand Finishing Crosstubes

\*\*\*WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.\*\*\*

1- CLEAN CROSSTUBE WITH WASH'N WIPE

/ CR 14-03-12

180

Outsource process - NDT per QSI038 4.1

0.00

**\*180\***

Outsource2

Memo

0.00

Outsource process - NDT

\*\*\*WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.\*\*\*

Liquid Penetrant Inspection as per QSI 038

Issue P/O: 23352

LPI as per ASTM 1417 Level 2

Attach copy of NDT results to work order

14-03-13

190

Receive &amp; Inspect for Damage &amp; Mat'l Certs

0.00

**\*190\***

Packaging

Packaging

Memo

0.00

Packaging

\*\*\*WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.\*\*\*

Ensure copy of NDT results attached to work order.

14/3/12 (U)

DQA: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

Work Order: _____  Part No. _____  NCR No. _____	<b>DISPOSITION</b>  <div style="display: flex; justify-content: space-between;"> <div>             Rework <input type="checkbox"/>              Scrap <input type="checkbox"/>              Use-as-is <input type="checkbox"/>              Suspected Unapproved <input type="checkbox"/> </div> <div>             Skid-tube <input type="checkbox"/>              Machining <input type="checkbox"/>              Thermoforming <input type="checkbox"/>              Large Fab <input type="checkbox"/> </div> <div>             Crosstube <input type="checkbox"/>              Small Fab <input type="checkbox"/>              Finishing <input type="checkbox"/>              Composite <input type="checkbox"/> </div> <div>             Water Jet <input type="checkbox"/>              Prod. Eng. Coord. <input type="checkbox"/>              Rec/Store/Packaging <input type="checkbox"/>              Supplier <input type="checkbox"/> </div> <div>             Engineering <input type="checkbox"/>              Quality <input type="checkbox"/>              Other <input type="checkbox"/> </div> </div>	
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Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
Equip/Tooling	<input type="checkbox"/>								
Handling/Pre	<input type="checkbox"/>								
Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

### FAULT CATEGORY

<b>Landing Gear</b> <input type="checkbox"/> Bearing <input type="checkbox"/> Center Not Concentric <input type="checkbox"/> Cracks <input type="checkbox"/> Creep/Kink/Ripple/Wave <input type="checkbox"/> Cuff <input type="checkbox"/> Cracking <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Malfunction/Chatter <input type="checkbox"/> Timing Sequence <input type="checkbox"/> Wobble/Twist in Tube	<b>General</b> <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence
<div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Outside Dimensions  <input type="checkbox"/> Over/Under tolerance  <input type="checkbox"/> Part Incorrect  <input type="checkbox"/> Part Lost/Missing  <input type="checkbox"/> Part Moved  <input type="checkbox"/> Positioned Wrong  <input type="checkbox"/> Power Loss/Surge           </div> <div> <input type="checkbox"/> Pressure/Forced  <input type="checkbox"/> Set-up  <input type="checkbox"/> Temperature/Cure  <input type="checkbox"/> Weld  <input type="checkbox"/> Wrong Stock Pulled  <input type="checkbox"/> Other           </div> </div>		



**Work Order ID 114478**

Thursday, March 06, 2014 11:36:18 AM

**\*114478\***

Page 5

Item ID: D212-664-201

Accept

**\*N900040100\***Setup Start **\*NS1\***

Revision ID:

Item Name: Aft Crosstube - High

Stop **\*NS2\***

Start Date: 3/6/2014 Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 3/12/2014 Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
200	QC5- Inspect part completeness to step on W/O	0.00							
<b>*200*</b>									
QC	Memo	0.00	DAS						
Quality Control	***WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.***		16						
	Inspect for damage & ensure results are as per Dwg D212-664-241		9-89	14/03/13					
204	Crosstubes Chemical Conversion	0.00							
<b>*204*</b>									
HandFXtube	Memo	0.00							
Hand Finishing Crosstubes	***WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.***								
	1- PRESSURE WASH AND THEN USE WASH'N WIPE TO CLEAN CROSSTUBE BEFORE CHEMICAL CONVERSION								
206	QC7-Inspect Chemical Conversion Coat	0.00							
<b>*206*</b>									
QC	Memo	0.00							
Quality Control	***WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.***								

*EB 14-03-13**1 0 0 A8 14-3-13*

DQA: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

Work Order: _____  Part No. _____  NCR No. _____	<b>DISPOSITION</b>  Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	<b>AGAINST DEPARTMENT/PROCESS</b>  <table style="width:100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
Equip/Tooling	<input type="checkbox"/>								
Handling/Pre	<input type="checkbox"/>								
Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

### FAULT CATEGORY

<b>Landing Gear</b> <input type="checkbox"/> Bearing <input type="checkbox"/> Center Not Concentric <input type="checkbox"/> Cracks <input type="checkbox"/> Creep/Kink/Ripple/Wave <input type="checkbox"/> Cuff <input type="checkbox"/> Cracking <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Malfunction/Chatter <input type="checkbox"/> Turbulence Sequence <input type="checkbox"/> Warpage/Twist in Tube	<b>General</b> <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge  <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled  <input type="checkbox"/> Other
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**Work Order ID 114478**

Thursday, March 06, 2014 11:36:18 AM

**\*114478\***

Page 6

Item ID: D212-664-201

Accept

**\*N900040100\***Setup Start **\*NS1\***

Revision ID:

Stop **\*NS2\***

Item Name: Aft Crosstube - High

Start Date: 3/6/2014 Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 3/12/2014 Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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210

Spray Painting per QSI005 4.2

0.00

**\*210\***

SprayPaint

SprayPaint

Memo

0.00

Spray Painting

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

1-Prime inside and outside crosstube as per QSI 005 4.2

PRIME BATCH: 126878Start Time: 10:30Finish Time: 11:00

\*\*\*MASK UNDERSIDE OF CROSSTUBE AS SHOWN ON DWG DEO\*\*\*

2-Paint outside crosstube with White Imron as per QSI 005 4.2

PAINT BATCH: 11/28 330Start Time: 1:00Finish Time: 1:30

3- Remove masking and apply matte clear coat as per dwg DEO

CLEAR BATCH: 125473

CR 14-03-17

PTD

- CR 14-03-20

- AB 14-3-19

DQA: Aut Date: 14/04/09QA Closed: AT Date: 14/4/14

## WORK ORDER NON-CONFORMANCE / UPDATE

Work Order update only ☐

Work Order: <u>1478</u>	<b>DISPOSITION</b> Rework <input checked="" type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	<b>AGAINST DEPARTMENT/PROCESS</b>			
Part No. <u>DZ 1-664-201</u>		Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>
NCR No. <u>1-3695</u>		Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>
		Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>
		Large Fab <input type="checkbox"/>	Composite <input checked="" type="checkbox"/>	Supplier <input type="checkbox"/>	

Root Cause	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QA Inspector
Design								
Doc/Data								
Equip/Tooling								
Handling/Pre								
Material								
Operator								
Offset/Setup								
Process <input checked="" type="checkbox"/>								
Supplier								
Training								
Transport								
Unapproved								

## FAULT CATEGORY

Landing Gear	General	
<input type="checkbox"/> Bearing	<input type="checkbox"/> Bend	<input type="checkbox"/> Folio/Program
<input type="checkbox"/> Center Not Concentric	<input type="checkbox"/> BOM/Route	<input type="checkbox"/> Grain
<input type="checkbox"/> Crack	<input type="checkbox"/> Broken/Damage/Defect	<input type="checkbox"/> Hardware
<input type="checkbox"/> Creep/Kink/Ripple/Wave	<input type="checkbox"/> Burrs	<input type="checkbox"/> Inspection Incomplete/Unqualified
<input type="checkbox"/> Cuff	<input type="checkbox"/> Contamination	<input type="checkbox"/> Instructions Incomplete/Unclear
<input type="checkbox"/> Cracking	<input type="checkbox"/> Countersink	<input type="checkbox"/> Misaligned/off center
<input type="checkbox"/> Heat Treat	<input type="checkbox"/> Cut Too Short	<input type="checkbox"/> Mislabeled
<input type="checkbox"/> Insertion Strip in Tube	<input type="checkbox"/> Drawing	<input type="checkbox"/> Misread
<input type="checkbox"/> Material/Chatter	<input type="checkbox"/> Drill Holes	<input type="checkbox"/> Off-set
<input type="checkbox"/> Tumbling Sequence	<input type="checkbox"/> Finish	<input type="checkbox"/> Out of Calibration
<input type="checkbox"/> Warpage/Twist in Tube	<input type="checkbox"/> Fit/Function	<input type="checkbox"/> Out of Sequence

- |   |  |
|---|--|
| <input type="checkbox"/> Outside Dimensions   | <input type="checkbox"/> Pressure/Forced             |
| <input type="checkbox"/> Over/Under tolerance | <input type="checkbox"/> Set-up                      |
| <input type="checkbox"/> Part Incorrect       | <input checked="" type="checkbox"/> Temperature/Cure |
| <input type="checkbox"/> Part Lost/Missing    | <input type="checkbox"/> Weld                        |
| <input type="checkbox"/> Part Moved           | <input type="checkbox"/> Wrong Stock Pulled          |
| <input type="checkbox"/> Positioned Wrong     |  |
| <input type="checkbox"/> Power Loss/Surge     | <input type="checkbox"/> Other                       |

DOOR SHOULD BE NOCKED OUT  
SIMILAR TO WHEN THERMOFORMING  
IS CARRIED OUT

# Work Order ID 114478

Thursday, March 06, 2014 11:36:18 AM

**\*114478\***

Page 7

Item ID: D212-664-201

Accept

**\*N900040100\***

Setup Start **\*NS1\***

Revision ID:

Stop **\*NS2\***

Item Name: Aft Crosstube - High

Start Date: 3/6/2014 Start Qty: 1.00 **\*1\***

Cust Item ID:

Required Date: 3/12/2014 Req'd Qty: 1.00 **\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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220

QC14- Inspect Spray Paint

0.00

**\*220\***

QC

Memo

0.00

DAS  
16  
9-89 14/03/20

Quality Control

Then, Wrap in plastic bag to protect from scratches

230

0.00

**\*230\***

Crosstubes

Crosstubes

Memo

0.00

1-Abrade mating surfaces of support and crosstube with 180 grit sandpaper, clean the area with MEK or equivalent as per dwg

2-Install supports with Proseal 890 per D212-664-241 (DEO) and QSI 015

A/R Proseal 890 Batch: 127662

EXP: 4/14

3-Install supports clamps Using Dt9565 as per Dwg D212-664-241

(DEO), Torque to 80-100 IN-LBS.

PROSEAL CURE TIME 72 HOURS:

Start: 3:00

Finish: 3:40

1 0 0 14-3-22

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

Work Order: _____  Part No. _____  NCR No. _____		<b>DISPOSITION</b>  Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	<b>AGAINST DEPARTMENT/PROCESS</b>  <div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/>            Machining <input type="checkbox"/>            Thermoforming <input type="checkbox"/>            Large Fab <input type="checkbox"/> </div> <div>           Crosstube <input type="checkbox"/>            Small Fab <input type="checkbox"/>            Finishing <input type="checkbox"/>            Composite <input type="checkbox"/> </div> <div>           Water Jet <input type="checkbox"/>            Prod. Eng. Coord. <input type="checkbox"/>            Rec/Store/Packaging <input type="checkbox"/>            Supplier <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/>            Quality <input type="checkbox"/>            Other <input type="checkbox"/> </div> </div>
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Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
Equip/Tooling	<input type="checkbox"/>								
Handling/Pre	<input type="checkbox"/>								
Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

**FAULT CATEGORY**

<b>Landing Gear</b> <input type="checkbox"/> Bearing <input type="checkbox"/> Center Not Concentric <input type="checkbox"/> Cracks <input type="checkbox"/> Critical 'Kink/Ripple/Wave <input type="checkbox"/> Cuff <input type="checkbox"/> Cracking <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Malfunction/Chatter <input type="checkbox"/> Turbulence Sequence <input type="checkbox"/> Warpage/Twist in Tube	<b>General</b> <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence
<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge		
<input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other		

**Work Order ID 114478**

Thursday, March 06, 2014 11:36:18 AM

**\*114478\***

Page 8

Item ID: D212-664-201

Accept

**\*N900040100\***Setup Start **\*NS1\***

Revision ID:

Stop **\*NS2\***

Item Name: Aft Crosstube - High

Start Date: 3/6/2014 Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 3/12/2014 Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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240

QC5- Inspect part completeness to step on W/O

0.00

DAS

16

9-89

14/03/24

**\*240\***

QC

Quality Control

Memo

\*\*\*RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED  
FOR 72HOURS AS PER DWG.\*\*\*

0.00

250

Pick Kit

0.00

DAS

32

9-89

14/3/27 (1)

**\*250\***

Packaging

Packaging

Memo

0.00

260

QC4- 100% Inspect kits for completeness

0.00

DAS

06

9-89

MAR 27 2014

h

**\*260\***

QC

Quality Control

Memo

0.00

DAS  
31  
9-89

DQA: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

Work Order: _____  Part No. _____  NCR No. _____	<b>DISPOSITION</b>  Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	<b>AGAINST DEPARTMENT/PROCESS</b>  <table style="width: 100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
Equip/Tooling	<input type="checkbox"/>								
Handling/Pre	<input type="checkbox"/>								
Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

### FAULT CATEGORY

<b>Landing Gear</b> <input type="checkbox"/> Bend <input type="checkbox"/> Not Concentric <input type="checkbox"/> Kink/Ripple/Wave <input type="checkbox"/> Cracking <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Malfunction/Chatter <input type="checkbox"/> Turbulence Sequence <input type="checkbox"/> Warpage/Twist in Tube	<b>General</b> <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge  <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
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**Work Order ID 114478**

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**\*114478\***

Page 9

Item ID: D212-664-201

Accept

**\*N900040100\***

Setup Start

**\*NS1\***

Revision ID:

Stop

**\*NS2\***

Item Name: Aft Crosstube - High

Start Date: 3/6/2014 Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 3/12/2014 Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals:

Process Plan: \_\_\_\_\_

Date: \_\_\_\_\_

Tooling: \_\_\_\_\_

Date: \_\_\_\_\_

Run Start

**\*NR1\***

QC: \_\_\_\_\_

Date: \_\_\_\_\_

SPC (Y/N): \_\_\_\_\_

Date: \_\_\_\_\_

Stop

**\*NR2\***Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

270

0.00

**\*270\***

Packaging

DAS

06

9-89

Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPP D212-664-201

280

0.00

**\*280\***

QC21- Final Inspection - Work Order Release

QC

Memo

0.00

Quality Control

MLJ 1403-28

MLJ 1403-28

DQA: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

Work Order: _____  Part No. _____  NCR No. _____	<b>DISPOSITION</b>  Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	<b>AGAINST DEPARTMENT/PROCESS</b>  <table style="width:100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
Equip/Tooling	<input type="checkbox"/>								
Handling/Pre	<input type="checkbox"/>								
Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

### FAULT CATEGORY

<b>Landing Gear</b> <input type="checkbox"/> Bend <input type="checkbox"/> Center Not Concentric <input type="checkbox"/> Crack <input type="checkbox"/> Creep <input type="checkbox"/> Cuff <input type="checkbox"/> Crushing <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Machine Chatter <input type="checkbox"/> Turbulence Sequence <input type="checkbox"/> Warpage Twist in Tube	<b>General</b> <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge  <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
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Thursday, March 06, 2014 11:36:32 AM

**\*114478\***

**\*D212-664-201\***

**Required Date:** 3/12/2014

**Required Qty: 1.00**

**Comments:** IPP Rev:E04.02.16ReformatK/DS  
 IPP Rev:F 06-03-29 Remove Coments on Pick List JLM  
 IPP Rev:G 07-04-30 As per Rev C JLM  
 IPP Rev:H 08-05-22 up date Qty of rubber cushion DD verified by:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D212-664- 201TRNRevC		Manufactured	No			110	Each	0.0000	1	1	MO	14/03/06	
*D212-664-201TRNRevC*									**				
Crosstube Turning Detail													
D3595-063-530		Manufactured	No			230	Each	37.0000	2	2			
*D3595-063-530*									**				
Rubber Cushion													

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
FG	5	
82656	5	
FP	8	
111194	8	
LG	18	
110937	18	
LG050	1	
106512	1	
LG051	5	
110485	5	
115317		4

DQA: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

Work Order: _____  Part No. _____  NCR No. _____	<b>DISPOSITION</b>  Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	<b>AGAINST DEPARTMENT/PROCESS</b>  <table style="width:100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
Equip/Tooling	<input type="checkbox"/>								
Handling/Pre	<input type="checkbox"/>								
Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

### FAULT CATEGORY

<b>Landing Gear</b> <input type="checkbox"/> Bearing <input type="checkbox"/> Center Not Concentric <input type="checkbox"/> Cracks <input type="checkbox"/> Critical Kink/Ripple/Wave <input type="checkbox"/> Cuff <input type="checkbox"/> Cracking <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Malfunction/Chatter <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Warpage/Twist in Tube	<b>General</b> <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge  <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled  <input type="checkbox"/> Other
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# Picklist Print

Thursday, March 06, 2014 11:36:32 AM

Work Order ID: 114478

**\*114478\***

Parent Item: D212-664-201

**\*D212-664-201\***

Parent Item Name: Aft Crosstube - High

Start Date: 3/6/2014

Required Date: 3/12/2014

Start Qty: 1.00

Required Qty: 1.00

D2940-1

Manufactured No

230

Each

27.0000

2

2

**\*D2940-1\***

Support

**\*\***

*AS 14-3-22*

Location

Loc Qty

Loc Code

LG052

9

103951

6

109042

3

LG53

18

109947

18

2

MS21920-28

Purchased

No

230

Each

106.0000

4

4

**\*MS21920-28\***

Clamp

**\*\***

*AS 14-3-22*

Location

Loc Qty

Loc Code

FG

5

105884

5

LG050

101

M127061

1

M127544

11

M127785

3

M128129

44

M128363

42

4

D3428-1

Manufactured

No

250

Each

23.0000

1

1

**\*D3428-1\***

Placard

**\*\***

DAS  
32  
9-89

*14/3/27*

Location

Loc Qty

Loc Code

ST042

23

107703

1

111100

10

112604

12

111100

DAS  
06  
9-89

DAS  
31  
9-89

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

Work Order: _____  Part No. _____  NCR No. _____	<b>DISPOSITION</b>  Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	<b>AGAINST DEPARTMENT/PROCESS</b>  <table style="width: 100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
Equip/Tooling	<input type="checkbox"/>								
Handling/Pre	<input type="checkbox"/>								
Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

**FAULT CATEGORY**

<b>Landing Gear</b> <input type="checkbox"/> Berig <input type="checkbox"/> Cer Not Concentric <input type="checkbox"/> Cra <input type="checkbox"/> Crit 'Kink/Ripple/Wave <input type="checkbox"/> Cuf <input type="checkbox"/> Cru ng <input type="checkbox"/> Hea reat <input type="checkbox"/> Ins tion Strip in Tube <input type="checkbox"/> Ma /Chatter <input type="checkbox"/> Tur g Sequence <input type="checkbox"/> Wa /Twist in Tube	<b>General</b> <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge  <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled  <input type="checkbox"/> Other
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# Picklist Print

Thursday, March 06, 2014 11:36:34 AM

Page 3

Work Order ID: 114478

**\*114478\***

Parent Item: D212-664-201

**\*D212-664-201\***

Parent Item Name: Aft Crosstube - High

Start Date: 3/6/2014

Required Date: 3/12/2014

Start Qty: 1.00

Required Qty: 1.00

MS21042L6

Purchased

No

250

Each

211.0000

6

6

**\*MS21042L6\***

Nut

DAS  
06  
9-89

Location

Loc Qty

Loc Code

ST314

211

m127304

2

m127831

26

m127904

183

DAS  
32  
9-89

DAS  
31  
9-89

NAS1149D0663J

Purchased

No

250

Each

2,061.000

18

18

**\*NAS1149D0663J\***

Washer

DAS  
06  
9-89

Location

Loc Qty

Loc Code

ST294

7

123265

4

M126284

3

ST510a

2054

M126334

699

M127813

655

M127916

700

DAS  
32  
9-89

DAS  
31  
9-89

AN6-40A

Purchased

No

250

Each

49.0000

4

4

**\*AN6-40A\***

Bolt

DAS  
06  
9-89

Location

Loc Qty

Loc Code

ST504

49

M127817

49

DAS  
32  
9-89

DAS  
31  
9-89

AN6-41A

Purchased

No

250

Each

28.0000

2

2

**\*AN6-41A\***

Bolt

DAS  
06  
9-89

Location

Loc Qty

Loc Code

ST340

28

M126180

28

DAS  
32  
9-89

14/3/27

DAS  
31  
9-89

Thursday, March 06, 2014 11:36:36 AM

Shop Packet Print

Page 3

DQA: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

Work Order: _____  Part No. _____  NCR No. _____	<b>DISPOSITION</b>  Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	<b>AGAINST DEPARTMENT/PROCESS</b>  <div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/>            Machining <input type="checkbox"/>            Thermoforming <input type="checkbox"/>            Large Fab <input type="checkbox"/> </div> <div>           Crosstube <input type="checkbox"/>            Small Fab <input type="checkbox"/>            Finishing <input type="checkbox"/>            Composite <input type="checkbox"/> </div> <div>           Water Jet <input type="checkbox"/>            Prod. Eng. Coord. <input type="checkbox"/>            Rec/Store/Packaging <input type="checkbox"/>            Supplier <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/>            Quality <input type="checkbox"/>            Other <input type="checkbox"/> </div> </div>
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Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
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Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

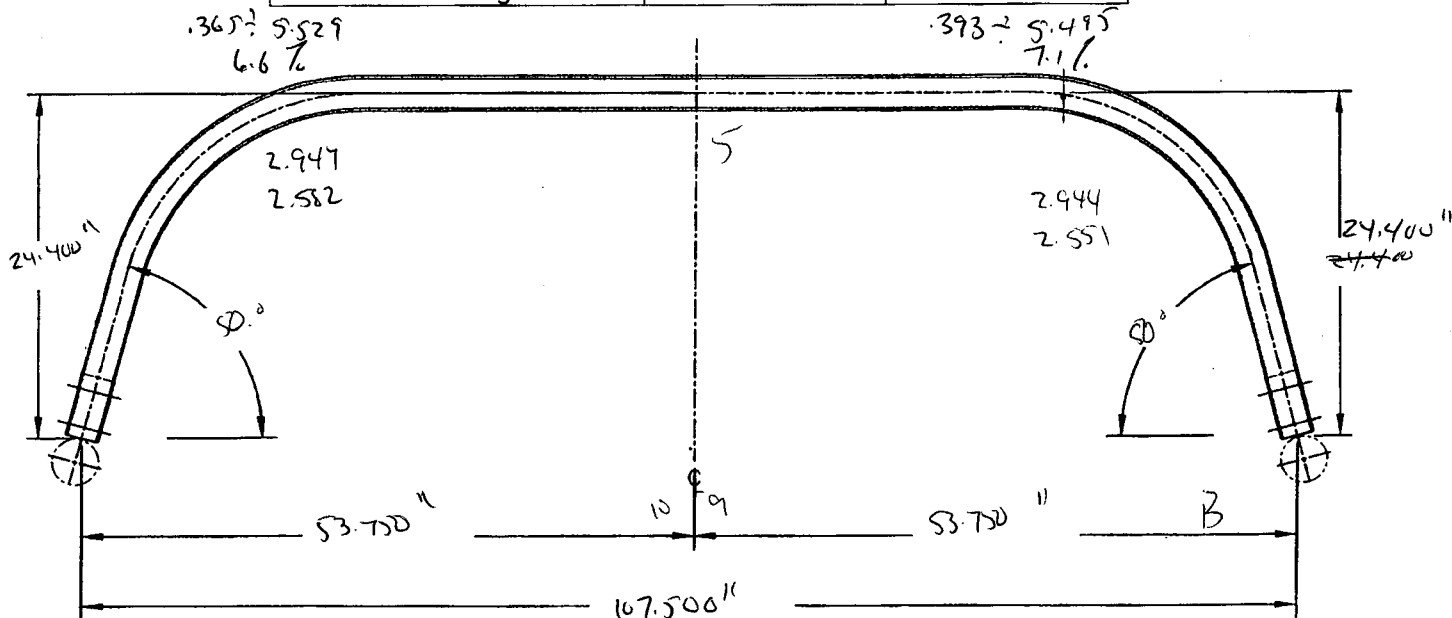
### FAULT CATEGORY

<b>Landing Gear</b> <input type="checkbox"/> Bearing <input type="checkbox"/> Center Not Concentric <input type="checkbox"/> Cracks <input type="checkbox"/> Critical 'Kink/Ripple/Wave <input type="checkbox"/> Cuff <input type="checkbox"/> Cracking <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Malfunction/Chatter <input type="checkbox"/> Timing Sequence <input type="checkbox"/> Warpage/Twist in Tube	<b>General</b> <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence  <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge  <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
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<b>DART AEROSPACE LTD</b>		<b>Work Order:</b>	114478
<b>Description:</b> Crosstube High Aft (205/212)		<b>Part Number:</b>	D212-664-201
<b>Inspection Dwg:</b> D212-664-241		<b>Rev:</b> D	<b>Page 1 of 1</b>

Required Dimension	Min	Max
Height	24.17	24.43
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.70
Bending Passes	5	--
Crushing	--	6%



	Side A	MIDDY.	Side B
Bending Passes	10	5	9
Crushing	6.6%		7.1%
<b>Comments</b>			
Side A 2 6.6% crushing @ 10 Passes			
MIDDY 5 Passes			
Side B 2 7.1% crushing @ 9 Passes			

QC15 Inspection	DAS
Date	16
	9-89 14/03/10

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.08	Dimensions updated per Dwg rev. C	KJ/JLM	
C	10.04.01	Dwg Rev updated	KJ	
D	12.04.16	Added bending, crushing dimensions	KJ	

Item	Qty -241	Qty -241B	Part Number	Description
1	X		D212-664-241	CROSSTUBE ASSEMBLY (205/212 HIGH AFT)
2		X	D212-664-241B	CROSSTUBE ASSEMBLY (214 HIGH AFT)
3	1	1	D6006-129	CROSSTUBE
4	2	2	D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6	4	4	MS21920-28	CLAMP (OR MS21920-30)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION R80-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

#### GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6006-129  
FINISHED LENGTH = 124.362±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF  
USING VIBRATING STYLUS.
- 7) WEIGHT: D212-664-241 = 44.2 lbs (PER IIN-D212-664)  
D212-664-241B = 44.2 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 5 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D2940-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

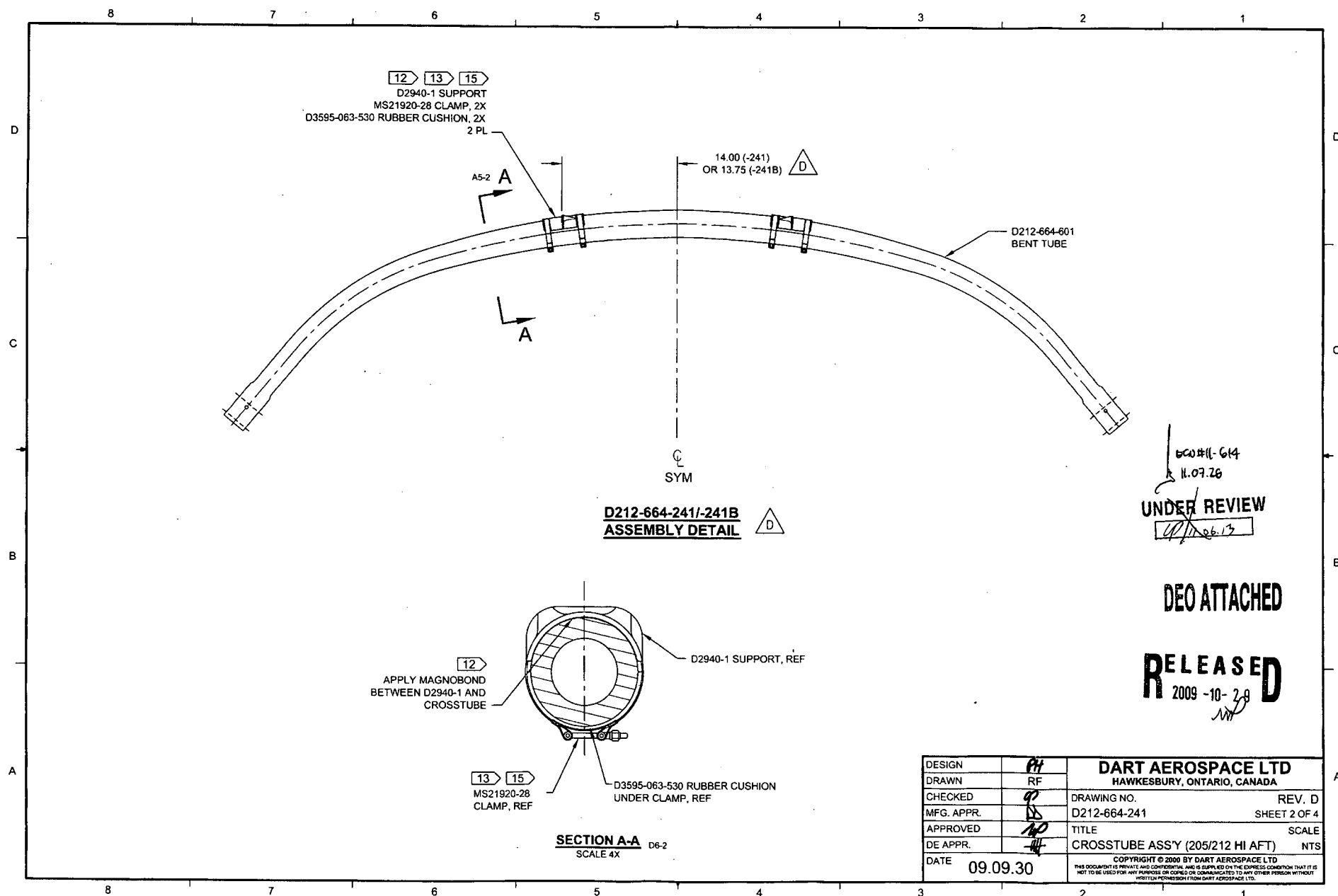
D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -241B (ZN D4-2, B4-2); REMOVED REF & ADD TOLERANCES (ZN D8-3 & C4-3, C6-3 & A8-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -1009 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	PH	DRAWING NO.	REV. D
MFG. APPR.	PH	D212-664-241	SHEET 1 OF 4
APPROVED	PH	TITLE	SCALE
DE APPR.	PH	CROSSTUBE ASS'Y (205/212 HI AFT)	NTS
DATE	09.09.30	COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

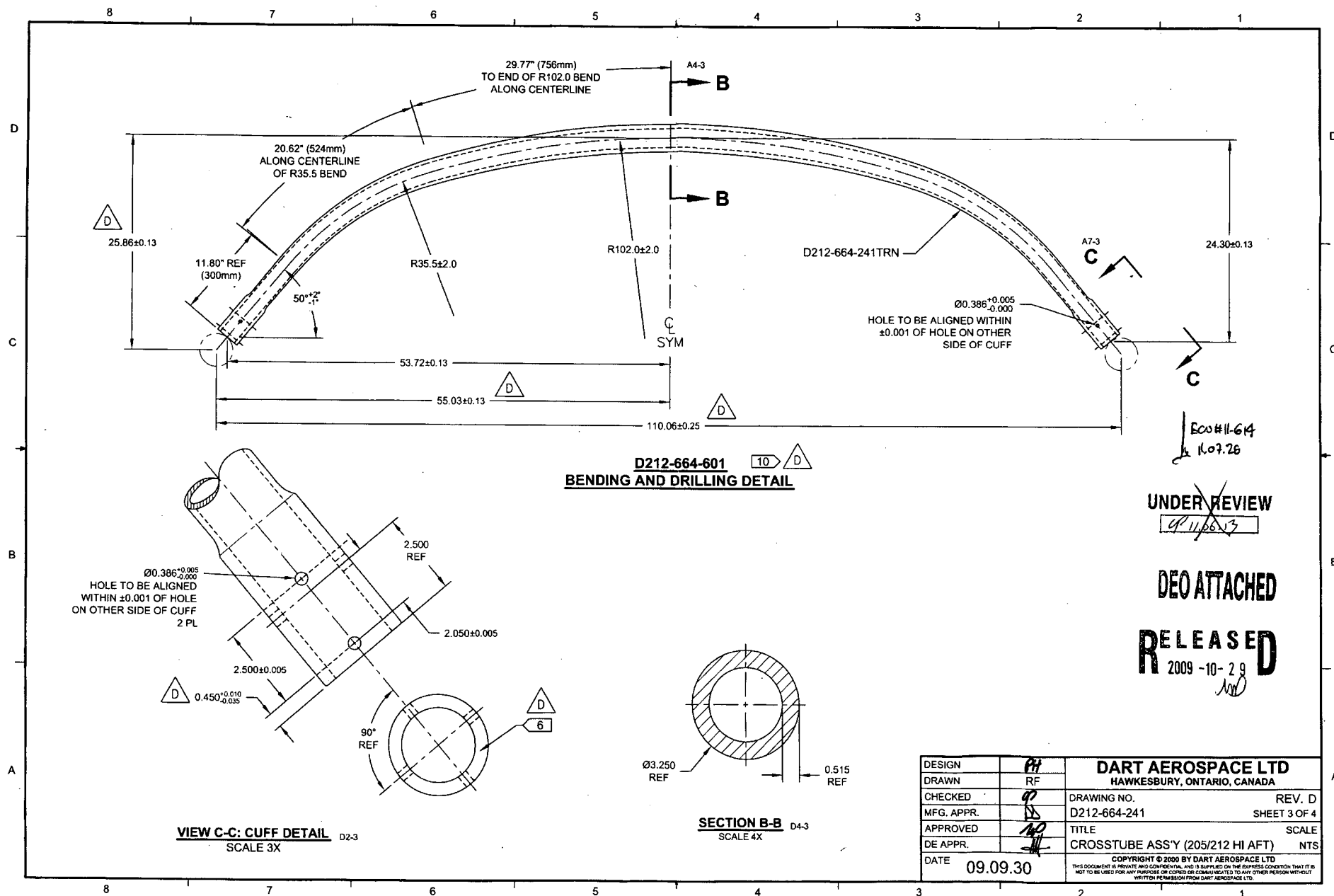
114478 MLC  
14-03-06

11.08.25  
11.08.25  
UNDER REVIEW  
11.08.25

DEO ATTACHED

RELEASED  
R 2009 -10-29





ECO #11-614  
10.07.26

UNDER REVIEW

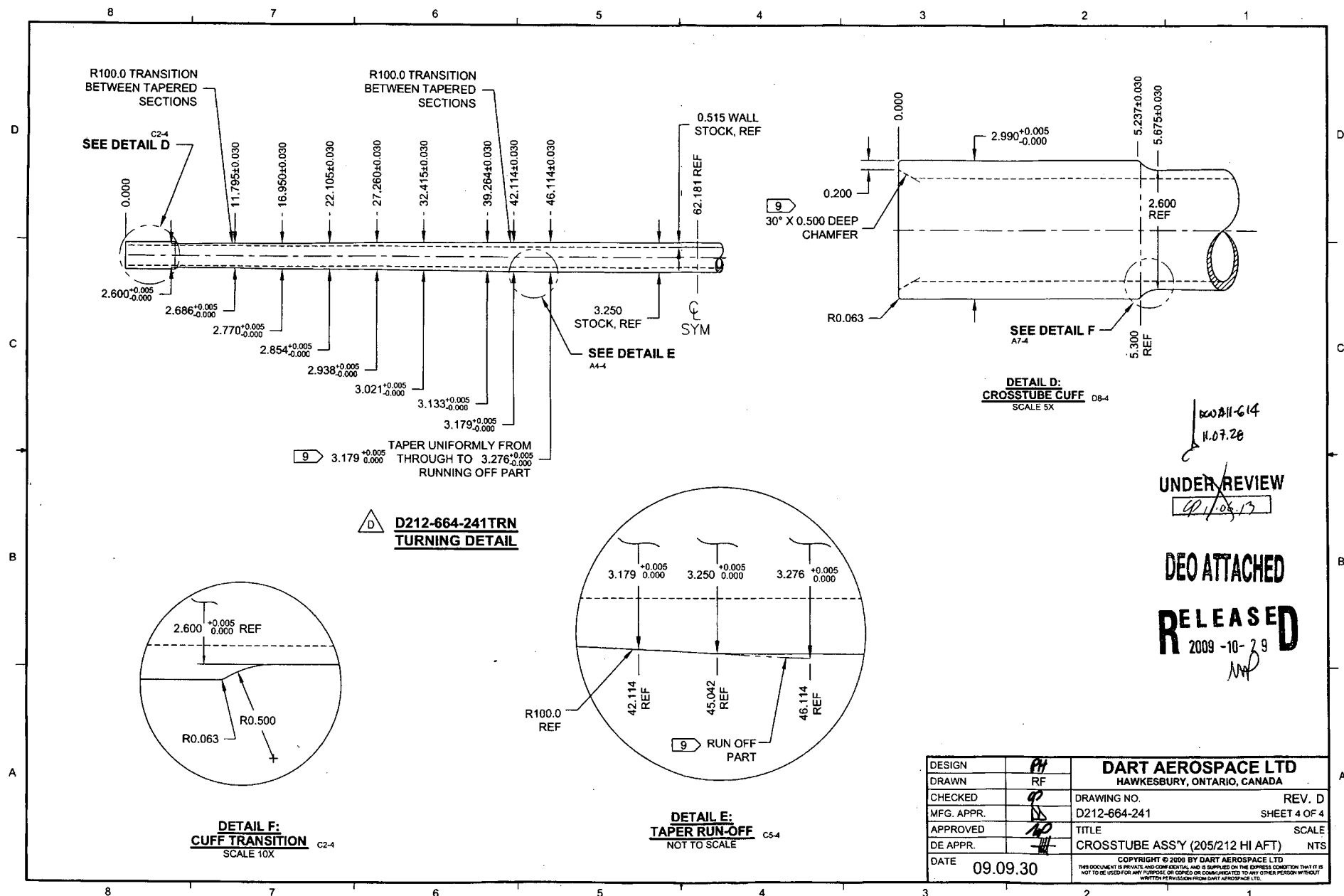
09/11/2013

DEO ATTACHED

RELEASED

2009-10-29

MD



DRAWING NO. D212-664-241	TITLE CROSSTUBE ASSY (205/212 HI AFT)	REV. D	DART AEROSPACE LTD. ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN	CHECKED	MFG. APPR.	APPROVED	DE APPR.			
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12			

**PURPOSE:**

ADD AN INSPECTION WINDOW TO UNDERSIDE OF CROSSTUBE.

**CHANGE:**

NOTES 2 OF SHEET 1 IS AMENDED AS FOLLOWS:

**IS:**

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND  
PAINT OUTSIDE PER DART QSI 005 4.2  
REMOVE MASKING AND APPLY CLEAR COAT

**WAS:**

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2

**RELEASED**  
2011-04-18

**UNDER REVIEW**

11.06.13

BCN#1-614

11.07.20

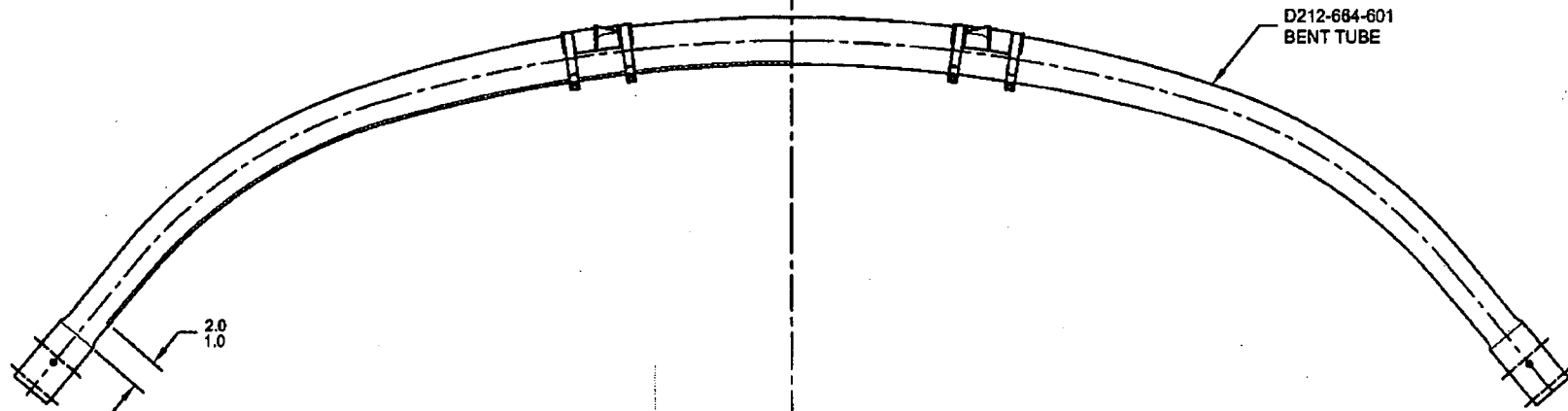
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DRAWING NO. D212-664-241	TITLE CROSSTUBE ASSY (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-1	SHEET NO. SHEET 2 OF 2	SCALE NTS
DRAWN	CHECKED <i>UP</i>	MFG. APPR. <i>E</i>	APPROVED <i>MD</i>	DE APPR. <i>MD</i>			
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12			

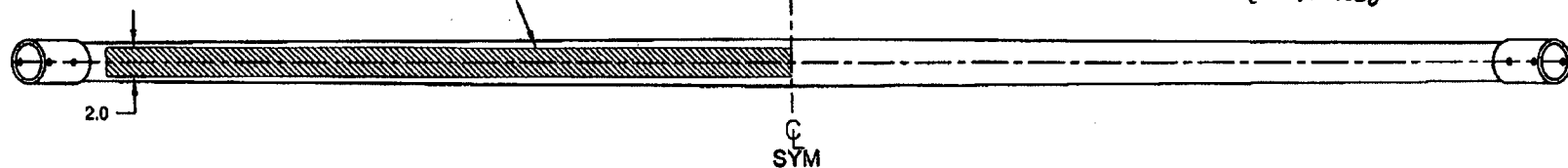
IS:

WAS:



**D212-664-241/-241B  
ASSEMBLY DETAIL**

MASK AREA PRIOR TO PAINTING,  
REMOVE MASKING AFTER PAINT  
AND APPLY CLEAR COAT



**RELEASED**  
2011-04-18

**UNDER REVIEW**

*UP* 11.06.13  
DOW 11.04.12  
11.07.28

DRAWING NO. D212-664-241	TITLE CROSSTUBE ASS'Y (205/212 HI AFT)	REV. D	<b>DART AEROSPACE LTD ENGINEERING ORDER</b>		D.E.O. NO. D212-664-241-D-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>q</i>	CHECKED <i>ASS</i>	MFG. APPR. <i>8</i>	APPROVED <i>MD</i>		DE APPR. <i>HA</i>		
DATE 11.07.15	DATE 11.07.20	DATE 11.07.21	DATE 11/27/21		DATE 11-07-21		

**PURPOSE:**

REPLACE MAGNOBOND WITH PROSEAL.

**CHANGE:**

IS:

Item	Qty -241	Qty -241B	Part Number	Description
7	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
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NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) TO INSTALL D2940-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. **PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.**

WAS:

- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

**RELEASED**  
2011-07-28  
*W*



## 212-664-201 "Folio"

### Batch#:

#### Setup

Rollers 3.25 x 3 \*\*\*\*without spacers\*\*\*...

Large Table, Shims 1.85" for SA bend, shims 1.7" for SB bend (new buggy)/adjust supporting rollers as required.

From cuffs, mark tube @ 32.1875 & **35.1875 RED** and center line

#### Middle Bend

Start bending on 32.1875 line w/tube on LARGE TABLE. Approach from this line is **2775 on both Y&W**. Use programs middle auto.

Bend middles even to reference line on reference board in order for side programs to be effective.

#### Side bends

Start bending on **35.1875** line with long part of tube on LARGE TABLE. approach of **Y 1900 W 3735**

Run programs s01-s05 without stopping, CHECK, then s06 to 16 to finish. CHECK between each program..

Approach for Prog s06 to s16 is Y 2190 and W 3735

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### **CHANGED 35.187 LINE TO 34.9, did not work! DP 11-8-11**

11/11/02 tried new tangent line today. tube was far too high. nearly scrapped. 24.75 on one side, 24.5625 on the other. max tolerance is 24.43. jw

12/05/29 NOW USING ORIGINAL TANGENT LINES AGAIN

12-9-13 bent one tube. used original tangent lines. ran 212aMauto. then middlesfix. tube was very close to even on both sides of middle, one a hair under the reference line, and one a hair over. from there sides were run as per folio, then 5c,6,7,8,9,10 to finish. height and span were both close to nominal.

#### Passes:

1  
2  
3  
4  
5  

---

5c

Mauto

1  
2  
3  
4  
5  

---

5c

## D212-664-241 Crosstube Flattening Tolerance Analysis

The following calculation is used to justify Crosstube flattening up to 7.1%. Since the Crosstubes are primarily under bending loads, the cross section with 7.1% crushing will be compared to a round cross section inboard of the location of the flattening as shown in Figure 1.

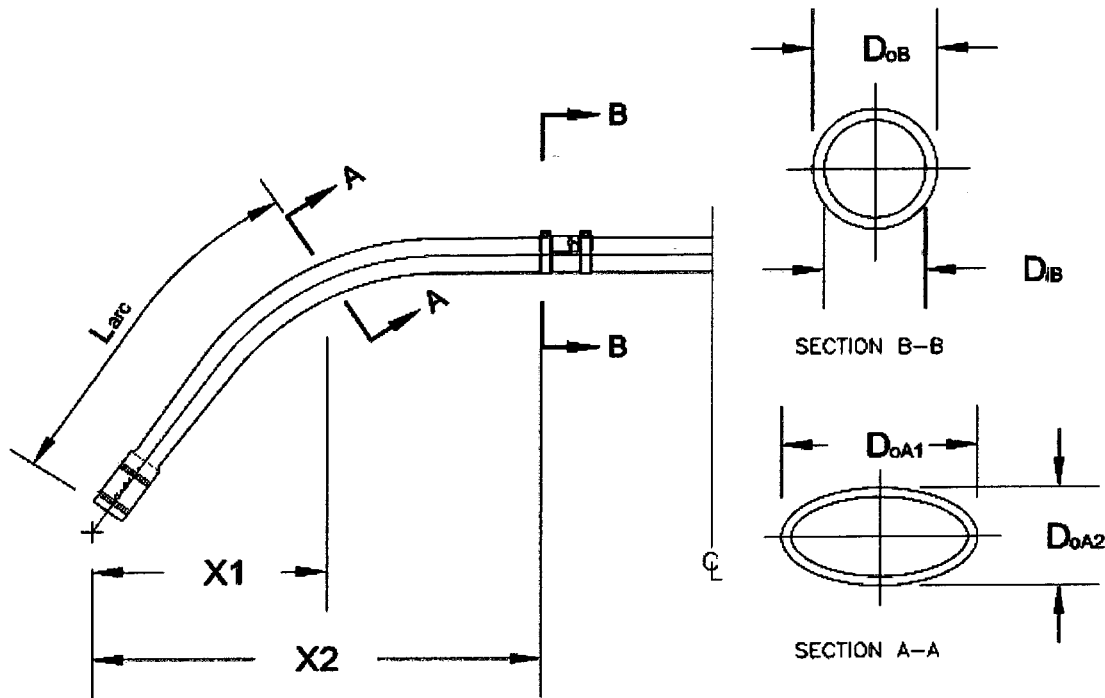


Figure 1- Analysis model

$D_{oB} := 3.25 \cdot \text{in}$	Nominal outer diameter of Section B-B (See Figure 1)
$D_{iB} := 2.22 \cdot \text{in}$	Nominal inner diameter of Section B-B (See Figure 1)
$D_{iA} := D_{iB}$	Nominal inner diameter of Section A-A (See Figure 1)
$t_{wB} := .515 \cdot \text{in}$	Nominal wall thickness at Section B-B
$t_{w, \text{tolerance}} := 0.020 \cdot \text{in}$	Wall thickness tolerance of material (+/-)
$OD_{\text{tolerance}} := 0.008 \cdot \text{in}$	Outer diameter tolerance of material (+/-)
$ID_{\text{max}} := D_{iB} - t_{w, \text{tolerance}}$	Maximum inner diameter
$ID_{\text{min}} := D_{iB} + t_{w, \text{tolerance}}$	Minimum inner diameter
$X_1 := 14.31 \cdot \text{in}$	Reference dimension (See Figure 1) , center of arc
$X_2 := 48.18 \cdot \text{in}$	Reference dimension (See Figure 1)
$L_{\text{arc}} := 22.51 \cdot \text{in}$	Reference dimension (See Figure 1)

Note: The above data was obtained from Dart drawings D212-664-241 Rev. D and D6006 Rev. A

## 1.0 Sectional Properties of Section A-A

Since the Crosstube is tapered along its length before it is bent, the outer diameter before bending must be determined, by assuming a linear taper. data points are taken from Dart drawing D350-748-141 to determine the change in taper along the length of the crosstube.

$X_1 := 22.105 \cdot \text{in}$	Linear data point 1 (Ref Dart Drawing D350-748-141 Sheet 4)
$X_2 := 27.260 \cdot \text{in}$	Linear data point 2 (Ref Dart Drawing D350-748-141 Sheet 4)
$D_{o1} := 2.854 \cdot \text{in}$	Diameter at point 1 (Ref Dart Drawing D350-748-141 Sheet 4)
$D_{o2} := 2.938 \cdot \text{in}$	Diameter at point 2 (Ref Dart Drawing D350-748-141 Sheet 4)

Theoretical outer diameter before bending at Section A-A is given by,

$$D_{o,A} := \frac{D_{o2} - D_{o1}}{X_2 - X_1} \cdot (L_{\text{arc}} - X_1) + D_{o1}$$

$$D_{o,A} = 2.861 \cdot \text{in}$$

Using the theoretical outer diameter before bending and knowing that the crushing will be 7.1%, dimensions of the major and minor axis for the elliptical section A-A shown in Figure 1 can be determined as follows,

$C\% := 0.071$	Percentage of flattening
$D_{oA1} := D_{o,A} + (D_{o,A} \cdot C\%)$	Long axis of ellipse (See Figure 1)
$D_{oA1} = 3.064 \cdot \text{in}$	
$D_{oA2} := D_{o,A} - D_{o,A} \cdot C\%$	Short axis of ellipse (See Figure 1)
$D_{oA2} = 2.657 \cdot \text{in}$	

The most conservative wall thickness at Section A-A can be determined as follows,

$$t_{wA} := \frac{D_{o,A} - ID_{\text{max}}}{2}$$

$$t_{wA} = 0.33 \cdot \text{in}$$

## Moment of inertia for Section A-A

$$I_A := \left[ \frac{3.1416}{4} \cdot \frac{D_{oA1}}{2} \cdot \left( \frac{D_{oA2}}{2} \right)^3 \right] - \frac{3.1416}{4} \cdot \left( \frac{D_{oA1}}{2} - t_{wA} \right) \cdot \left[ \left( \frac{D_{oA2}}{2} - t_{wA} \right)^3 \right]$$

$$I_A = 1.883 \cdot \text{in}^4$$

## 2.0 Sectional Properties of Section B-B

$$I_B := \frac{3.1416}{64} \cdot \left[ (D_{oB} + OD_{\text{tolerance}})^4 - ID_{\text{min}}^4 \right]$$

$$I_B = 4.295 \cdot \text{in}^4$$

## 3.0 Maximum Stress at Section A-A

$$S_{\text{maxA}} := \frac{X_1 \cdot D_{oA} \cdot 1 \cdot \text{lb}}{2 \cdot I_A}$$

Maximum stress assuming unit load

$$S_{\text{maxA}} = 10.869 \cdot \frac{\text{lb}}{\text{in}^2}$$

## 4.0 Maximum Stress at Section B-B

$$S_{\text{max}} := \frac{X_2 \cdot (D_{oB} + OD_{\text{tolerance}}) \cdot 1 \cdot \text{lb}}{2 \cdot I_B}$$

Maximum stress assuming unit load

$$S_{\text{max}} = 18.274 \cdot \frac{\text{lb}}{\text{in}^2}$$

## 5.0 Margin of Safety

$$MS := \frac{S_{\text{max}}}{S_{\text{maxA}}} - 1$$

$$MS = 0.681$$

Therefore flattening on the bent section by 7.1% is structurally acceptable based on a positive margin of safety.



**skyservice****Work Order Traveler**

Sky Service F.B.O. Inc.

Page: 1 of 2

DOT APP 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO20196	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: 23335
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN: 0	CSN: 0	TSO: 0	
Task: <b>UNSCHEDULED</b>			Sequence: 1

**Work Required:**

CARRY OUT NDT INSPECTION (LIQUID PENETRANT) ON 14 CROSSTUBES:

ID#: D350-748-201 AFT CROSSTUBE - HIGH

- 1 - WORK ORDER ID#: 102808
- 2 - WORK ORDER ID#: 110105
- 3 - WORK ORDER ID#: 110110
- 4 - WORK ORDER ID#: 111460
- 5 - WORK ORDER ID#: 110707

ID#: D212-664-201 AFT CROSSTUBE - HIGH

- 6 - WORK ORDER ID#: 114476
- 7 - WORK ORDER ID#: 114477
- 8 - WORK ORDER ID#: 114478
- 9 - WORK ORDER ID#: 114479

ID#: D350-748-101 FWD CROSSTUBE

- 10 - WORK ORDER ID#: 110174
- 11 - WORK ORDER ID#: 110173

ID#: D407-667-105 FWD CROSSTUBE

- 12 - WORK ORDER ID#: 114428
- 13 - WORK ORDER ID#: 112868
- 14 - WORK ORDER ID#: 112869

<b>Action Taken:</b>	Date:	Initial/Stamp:				
LIQUID PENETRANT INSPECTION CARRIED OUT ON ITEMS LISTED ABOVE (ITEMS 1-14) AS PER ASTM1417M-13  NO CRACK FOUND  Pen: ZL-56 BATCH# 09H094 EXP. DATE: AUG 2014, DEV: SKD-S2 EXP. DATE: OCT2017 CLEANER: SKC-S EXP. DATE: APR 2018	<div>DOT-APP 177 53-89</div> 12-March 2014	<div>DOT-APP 177 53-89</div> [Signature]				
<b>Description</b>	<b>Location</b>	<b>P/N</b>	<b>Qty</b>	<b>Batch</b>	<b>S/N Off</b>	<b>S/N On</b>

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

<b>Signature:</b>	<b>ACA/SCA Stamp</b>	<b>Date:</b>
<b>Name:</b>	<div>DOT-APP 177 53-89</div>	12-MARCH 2014
ANTONINO Marchetta		